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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Munehiro TABATA et al.

Title: SULFUR POISONING
ELIMINATION OF DIESEL
ENGINE CATALYST

Appl. No.:   10/713,355

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Examiner: T. M. Nguyen

Art Unit: 3748

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Number:

PRE-APPEAL REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the New **Pre-Appeal Brief Conference Pilot Program**, announced July 11, 2005, this Pre-Appeal Brief Request is being filed together with a Notice of Appeal.

Rejections under 35 U.S.C. § 103

Claims 15, 16, 24 and 27-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Published Patent Application 2003/0113249 to Hepburn et al. ("Hepburn") in view of U.S. Patent No. 6,574,956 to Moraal et al. ("Moraal"). Claims 17 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hepburn in view of Moraal, and further in view of U.S. Patent No. 6,938,411 to Hoffmann et al. ("Hoffmann"). Claims 20-23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hepburn in view of Moraal, and further in view of U.S. Patent No. 6,594,990 to Kuenstler et al. ("Kuenstler"). Claims 18-19

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and 25 stand rejected under § 103(a) as being unpatentable over Hepburn in view of Moraal, and further in view of legal precedent. Applicants respectfully traverse these rejections for at least the following reasons.

The device of independent claim 15 recites:

A purification device for an exhaust gas of a diesel engine, the diesel engine comprising a catalyst which traps nitrogen oxides in the exhaust gas but decreases a nitrogen oxides trapping performance when poisoned by sulfur oxides in the exhaust gas, and a filter which traps particulate matter in the exhaust gas, the device comprising:
a programmable controller programmed to:
determine if an elimination of the sulfur oxides poisoning the catalyst is required;
perform a process of eliminating the sulfur oxides poisoning the catalyst, when elimination of the sulfur oxides poisoning the catalyst has been determined to be required;
determine if a regeneration of the filter is required while performing the process of eliminating the sulfur oxides;
perform the regeneration of the filter while interrupting the process of eliminating the sulfur oxides, when the regeneration of the filter has been determined to be required;
determine during the regeneration of the filter if a residual particulate matter in the filter has decreased to a level which does not damage the filter when the residual particulate matter in the filter burns; and
stop the regeneration of the filter and resume the process of eliminating the sulfur oxides poisoning the catalyst, when the residual particulate matter in the filter has decreased to a level which does not damage the filter when the residual particulate matter in the filter burns.

Hepburn fails to disclose at least the above italicized feature of claim 15 in the context of that claim.

Hepburn discloses a routine in FIG. 4C for purging both SOx and particulate matter from a filter 19. Hepburn discloses a total time and intermediate time for removing SOx from the filter 19 as DSOXTIME and DSOX-CNT_PRD, respectively, and a total time and intermediate time for purging particulate matter as DPMTIME_MAX and DPMCNT_PRD, respectively (See paragraphs [0058], [0062] and [0076]). In step 274 of the routine in FIG. 4C, it is determined if the value DSOXCNT is greater than or equal to the intermediate time DSOX-CNT_PRD. When the determination in step 274 is affirmative, the total time DSOXTIME for SOx purging is

incremented in step 276, and the fuel flow rate F1 is set equal to zero in step 278 to create a lean mixture of exhaust gases for removing particulate matter from filter 19 (paragraph [0081]). In step 280, the value DPMCNT is incremented (paragraph [0084]). In step 282, a determination is made as to whether DPMCNT is greater than or equal to regeneration period DPMCNT_PRD. If the determination in step 282 is "Yes", the method advances to step 284 to terminate the particulate matter removal process (FIG. 4C).

Hepburn, however, does not disclose as recited in claim 15, a programmable controller programmed to "determine if a regeneration of the filter is required <u>while performing the process of eliminating the sulfur oxides</u>." Rather, Hepburn merely discloses stopping its intermediate SOx purge and performing particulate matter removal based on the value DSOXCNT being greater than or equal to the intermediate time DSOX-CNT_PRD. The values DSOXCNT and DSOX-CNT_PRD are values relating to the SOx purge time, and do not represent a determination that particulate matter regeneration of the particulate matter filter is required. The value DSOXCNT used in the determination in step 274 is a counter representing a duration of removal of sulfur oxides as can be understood from paragraph [0079]. The value DPMCNT used in the determination in step 282 is a counter representing a duration of removal of particulate matter as can be understood from paragraph [0084]. The routine of Hepburn in FIG. 4c, therefore, discloses starting removal of particulate matter from the filter when SOx elimination has been performed for a predetermined time period DSOXCNT_PRD and terminating removal of particulate matter when it has been performed for a predetermined time period DPMCNT_PRD. The routine of Hepburn continues to perform elimination of sulfur oxides until the determination in step 274 turns to be affirmative irrespective of the necessity of removal of particulate matter. Thus, Hepburn does not disclose determining if the regeneration of its particulate matter filter is required <u>while performing the process of eliminating the sulfur oxides</u>, as recited in claim 15, and claim 15 is patentable thereover for at least this reason.

The Patent Office states on page 9 of the Office Action:

> The Examiner has concluded that in step 274, Hepburn et al. determine if a regeneration of the catalyst to remove particulate matter is required while performing a process of eliminating SOx. Thus, in a broad reasonable interpretation of the claim language, Hepburn et al. indeed disclose or teach the claimed limitation in dispute.

Applicants respectfully disagree. Interpreting step 274 of Hepburn as disclosing determining if the regeneration of its particulate matter filter is required while performing the process of eliminating the sulfur oxides would not be a <u>reasonable</u> interpretation to one skilled in the art. Hepburn discloses in step 222 of FIG. 4A determining whether the accumulated particulate matter, CUMPM1, for filter 19 is greater than a predetermined maximum amount, CUMPM1_MAX, of particulate matter (<u>See</u> FIG. 4A, paragraphs [0054] and [0057]). If the accumulated particulate matter is greater than the predetermined maximum amount of particulate matter, then the particulate matter regeneration routine, PMREG1, is performed (<u>See</u> paragraph [0057]). When the cumulative amount of SOx, CUMSOX1, is also greater than a maximum value CUMSOX1_MAX, the routine SOXREG1-PMREG1 is executed to purge both SOx and particulate matter (paragraph [0063]). Thus, the determination of whether regeneration of the particulate matter filter is required is performed at step 222 in FIG. 4A, <u>before</u> performing the routine SOXREG1-PMREG1 in FIG. 4C to purge both SOx and particulate matter. The step 274 of the routine SOXREG1-PMREG1 is performed <u>after</u> it has already been determined in step 222 that regeneration of the particulate matter filter is required. Step 274 in Hepburn merely determines whether the intermediate time DSOX_CNT-PRD has been reached, so that the sulfur oxide elimination process can be suspended before beginning an intermediate particulate matter removal step. By the time step 274 has been reached, it has already been long determined in step 222 that the regeneration of the particulate matter filter is required, and one of ordinary skill in the art would have reasonably interpreted Hepburn as not disclosing the method of claim 15.

The remaining references applied in the rejections of the claims were cited for other features of the claims, but fail to cure the deficiencies of Hepburn.

Independent claims 27 and 28 respectively recite "means for determining if a regeneration of the filter is required while performing the process of eliminating the sulfur oxides" and "determining if a regeneration of the filter is required while performing the process of eliminating of the sulfur oxides", and are patentable over Hepburn for reasons analogous to claim 15.

The dependent claims are patentable for at least the same reasons as claim 15, from which they depend either directly or indirectly, as well as for further patentable features recited therein.

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date _July 16, 2008_   By _Thomas J. Bilodeau_

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